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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Yasuyuki MIMATSU et al.

Serial No.: 10/650,858

Filed: August 29, 2003

For: DATA BACKUP METHOD AND SYSTEM

**PETITION TO MAKE SPECIAL
UNDER 37 CFR 1.102(d) and MPEP. §708.02, VIII**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

December 29, 2004

Sir:

1. Petition

Applicants hereby petition to make this application **Special**, in accordance with 37 CFR §1.102(d) and MPEP 708.02, VIII. The present invention is a new application filed in the United States Patent and Trademark Office on August 29, 2003 and as such has not received any examination by the Examiner.

2. Claims

Applicants hereby represent that all the claims in the present application are directed to a single invention. If upon examination it is determined that all the claims presented are not directed to a single invention, Applicants will make an election without traverse as a prerequisite to the granting of special status.

12/30/2004 NNGUYEN1 00000014 10650858

01 FC:1464

130.00 OP

3. Search

Applicants hereby submit that a pre-examination search has been made by a professional searcher, (a copy of which is attached), in the following classes and subclasses:

<u>Class</u>	<u>Subclass</u>
707	204
711	114, 161, 162
714	5, 6

4. Copy of References

A listing of all references found by the professional searcher is provided on a Form PTO-1449 and copies of the references and the Form PTO-1449 are submitted as part of an Information Disclosure Statement (IDS) filed on even date.

5. Detailed Discussion of the References and Distinctions Between the References and the Claims

Below is a discussion of the references uncovered by the search and cited in the IDS filed on even date that appear to be most closely related to the subject matter encompassed by the claims of the present application, and which discussion particularly points out how Applicants' claimed subject matter is distinguishable over those references. All other references uncovered by the search and cited in the IDS filed on even date are **not** treated in detail herein.

a. Detailed Discussion of the References

U.S. Patent No. 6,205,450 (Kanome) discloses a disk snapshot section inserted between a file system and a disk unit appropriately takes a snapshot that holds the contents of files stored in the disk unit at a predetermined timing, and stores the snapshot in the disk unit. The disk snapshot section sets a virtual disk drive which stores files having the contents held by the designated snapshot upon restarting the system, and makes the file system recognize the virtual disk drive. The system can be easily restarted using a disk image of an arbitrary snapshot.

U.S. Patent No. 5,691,245 (DeKoning) discloses a mirrored data storage system utilizes a first host device and a local storage device for primary data storage and a second host device and a remote storage device for mirrored, fail-over storage on behalf of client devices. The remote storage device maintains a copy (called a snapshot) of the data at a common stable storage state. Given the snapshot and checkpoint information, the remote storage device can restore itself to the common stable storage state in the event of a failure of the first host device and/or the local storage device. Upon failure of the first host device and/or the local storage device, the second host device is instructed to initiate a switch, or fail-over, to serving as the primary data storage on behalf of the client devices.

U.S. Patent No. 6,694,413 (Mimatsu) discloses a method of managing snapshot data in a computer system having a storage subsystem. When acquisition of a snapshot is requested, a snapshot management program retained in memory inside the

computer is executed by the CPU of the computer. The computer memory retains the snapshot management information.

U.S. Patent Publication No. 2003/0131278 (Fujibayashi) discloses a method for remote backup that includes storing a snapshot of a primary storage device on a first snapshot volume and storing a snapshot of a secondary storage device on a second snapshot volume. A table of contents 210 (see, e.g., Fig. 3) is included at the remote host and includes data structures corresponding to the primary storage device and the secondary storage device.

U.S. Patent Publication No. 2004/0093474 (Lin) discloses a method for efficiently maintaining snapshot instances. To maintain the state of snapshot instances, the snapshot copies the data needed to be protected into free space on the same volume. In order to identify whether a block is free, a snapshot record is created for each block on a volume to record write operations on the block. With these snapshot records, the allocation status of blocks on a volume can quickly be identified. Free space allocation is then accomplished by allocating free space via the file-system provided interface and identifying it with snapshot records.

U.S. Patent Publication No. 2004/0168034 (Homma) discloses a storage apparatus controlling primary and secondary volumes as a pair, using a logical snapshot management table that indicates in which volume data to be accessed is retained to thereby enable an immediate access to a logical frozen image. The snapshot management table is stored in a control unit in the storage apparatus.

U.S. Patent Publication No. 2004/0186900 (Nakano) discloses a method of maintaining a plurality of snapshots in which a snapshot management table 211 (see, e.g., Fig. 2) is used for maintaining snapshot information. The snapshot management table is maintained on a memory 114 on a server apparatus 101.

b. Distinctions Between the References and the Claims

The present invention as recited in the claims filed are not taught or suggested by any of the above noted references whether taken individually or in combination with each other or in combination with any of the other references now of record.

The present invention as recited in the claims is directed to a method of backing up storage regions of a disk array in a computer system having a computer and the disk array that provides the storage regions used by the computer as an external storage, that includes: transmitting from the computer to the disk array a backup command accompanied by information about a first storage region having stored therein data to be backed up within the disk array and information about a second storage region into which the data to be backed up is to be stored as backup data within the disk array; backing up the data of the first storage region into the second storage region by the disk array in response to the command; sending from the computer to the disk array at least the information about the second storage region and information about backup of the first storage region; and storing, by the disk array, at least the information about the second storage region and the information about backup of the first storage region sent as above into a storage

region different from the second storage region within the disk array so that both the information can be stored as management information for the backup data, and to be associated with the backup data.

The above described features of the present invention, particularly storing, by the disk array, at least the information about the second storage region and the information about backup of the first storage region sent as above into a storage region different from the second storage region within the disk array so that both the information can be stored as management information for the backup data, and to be associated with the backup data, are not taught or suggested by any of the references of record whether taken individually or in combination with each other.

6. Fee (37 C.F.R. 1.17(i))

The fee required by 37 C.F.R. § 1.17(i) is to be paid by:

☒ the Credit Card Payment Form (attached) for \$130.00.

☐ charging Account _____ the sum of \$130.00.

A duplicate of this petition is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger & Malur, Deposit Account No. 50-1417 (500.43092X00).

Respectfully submitted,

MATTINGLY, STANGER & MALUR, P.C.



Frederick D. Bailey
Registration No. 42,282

FDB/sdb
Enclosures



JOHN R. MATTINGLY*
DANIEL J. STANGER
SHRINATH MALUR*

COLIN D. BARNITZ
GENE W. STOCKMAN
OF COUNSEL

JEFFREY M. KETCHUM
Registered Patent Agent

* Bar Membership Other Than Virginia

MATTINGLY, STANGER & MALUR, P.C.

ATTORNEYS AT LAW

1800 DIAGONAL ROAD, SUITE 370

ALEXANDRIA, VIRGINIA 22314

(703) 684-1120

PATENT, TRADEMARK
AND COPYRIGHT LAW

FACSIMILE: (703) 684-1157

October 29, 2004

CONFIDENTIAL
Attorney/Client Privileged

Via Federal Express

Re: Search for Petition to Make Special
US Pat. App. No. 10/650,858
Your Ref: 340300271US01
Our Ref: H-0410-013

Mr. Noboru Otsuka
Senior Patent Engineer
Intellectual Property Group
Patent Department IV
HITACHI, LTD.
292, Yoshida-cho, Totsuka-ku, Yokohama-shi
Kanagawa 244-0817, JAPAN

Dear Mr. Otsuka:

In accordance with your request of October 7, 2004, we have conducted a pre-examination prior art search in compliance with the requirements of MPEP 708.02 VIII (C) for filing a Petition to Make Special in the above-referenced patent application.

Subject Searched

The search was directed to the invention set forth in claims 1-13 in the above-referenced application. Specifically, claims 1-13 are directed to a disk array system and a method of backing up storage regions of a disk array in a computer system. The system includes a computer and a disk array that provides storage regions used as external storage by the computer. The computer transmits to the disk array a backup command accompanied by information about a first storage region having data stored to be backed up within the disk array, and information about a second storage region into which the data to be backed up is to be stored as backup data within the disk array. The data of the first storage region is backed

up into the second storage region in response to the backup command. Information about the second storage region and information about backup of the first storage region is sent from the computer to the disk array. The disk array stores at least the information about the second storage region and the information about backup of the first storage region sent into a storage region different from the second storage region within the disk array so that both the information about the second storage region and the information about the backup of the first storage region can be stored as management information for the backup data, and to be associated with the backup data.

Field of Search

We conducted our initial search using the US Patent Office's Examiner Application Search Tool (EAST) database and image retrieval system. The EAST database contains images of all issued US patents and published US patent applications searchable by subclass or document number. The EAST database also includes: the searchable full text of US patents issued since 1971; the searchable full text of all US published patent applications; and the searchable abstracts of a large number of patents and patent applications from the European and Japanese Patent Offices. We used keyword searching and forward/backward cross-referencing to locate relevant art, and we also searched, in particular, in the following *US Manual of Classification* subclasses:

<u>Class</u>	<u>Subclass</u>
707	204
711	114, 161, 162
714	5, 6

Because of the large size of these subclasses, we used keywords to narrow the number of documents returned. We also conducted a search for foreign art using the European Patent Office's ESPACENET database, and we searched, in particular, in international subclass G06F011/14A4B directed to backing up, restoring, or mirroring files or drives. Additionally, we conducted a search for relevant literature using the DIALOG online databases, but we did not locate any articles of particular interest.

Please note that although we use our best efforts to attempt to locate all relevant prior art when conducting a search, patent searching is an inexact discipline. Due to imprecision in the USPTO's methods of classifying patents, and vagaries in the system of patent drafting in general, we can never guarantee that all relevant art has been located. Thus, there is always some possibility that other relevant patents may exist in addition to those listed herein. Should you desire that we conduct additional searching on this subject, please let us know.

Prior Art Located

Patents and/or published patent applications located by our search that are believed to be of interest are enclosed as follows:

<u>Document No.</u>	<u>Inventor</u>
US 6205450	Kanome, Namiko
US 6691245	DeKoning, Rodney A.
*US 6694413	Mimatsu, Yasuyuki et al.
*US 20030131278	Fujibayashi, Akira
US 20040093474	Lin, Alvis et al.
*US 20040168034	Homma, Sigeo et al.
*US 20040186900	Nakano, Takahiro et al.

*Indicates Hitachi patent or published application

Discussion

As instructed, we have included below a discussion of each of these references explaining what each of the references teaches, and explaining why the claimed invention is not anticipated by the reference, or is otherwise distinguished from the reference.

The patent to Kanome, US 6205450, shows an computer system in which a snapshot and snapshot data 10 are stored in disk unit 4 (see, e.g., FIG. 1). However, Kanome does not teach the present invention wherein a disk array stores at least the information about a second storage region and the information about backup of a first storage region in a storage region different from the second storage region within the disk array.

The patent to DeKoning, US 6691245, shows a mirrored data storage system in which a snapshot and checkpoint information are stored together in remote storage. Thus, DeKoning does not teach the present invention in which the disk array stores at least the information about the second storage region and the information about backup of the first storage region in a storage region different from the second storage region within the disk array so that both the information about the second storage region and the information about the backup of the first storage region can be stored as management information for the backup data, and to be associated with the backup data.

The patent to Mimatsu, US 6694413, shows method of managing snapshot data in a computer system having a storage subsystem. When acquisition of a snapshot is requested, a snapshot management program retained in memory inside the computer is executed by the CPU of the computer. Thus, in Mimatsu, the computer memory retains the snapshot management information, unlike the present invention wherein it is maintained in a different region of a disk array.

The published US patent application to Fujibayashi, US 20030131278, shows a method for remote backup that includes storing a snapshot of a primary storage device on a first snapshot volume and storing a snapshot of a secondary storage device on a second snapshot volume. A table of contents 210 (see, e.g., FIG. 3) is included at the remote host

and includes data structures corresponding to the primary storage device and the secondary storage device. However, Fujibayashi does not teach the present invention, in which the disk array stores at least the information about the second storage region and the information about backup of the first storage region in a storage region different from the second storage region within the disk array.

The published US patent application to Lin, US 20040093474, shows a method for maintaining snapshots in which snapshot software can allocate free space to dynamically store snapshot metadata. However, unlike the present invention, the snapshots are not stored in a region within the disk array that is different from the region used to store the snapshot management information.

The published US patent application to Homma, US 20040168034, shows a storage apparatus in which a snapshot management table is stored in a control unit in the storage apparatus. Thus, Homma does not teach the present invention in which a disk array stores at least the information about a second storage region and the information about backup of a first storage region in a storage region different from the second storage region within the disk array.

The published US patent application to Nakano, US 20040186900, shows a method of maintaining a plurality of snapshots in which a snapshot management table 211 (see, e.g., FIG. 2) is used for maintaining snapshot information. The snapshot management table is maintained on a memory 114 on a server apparatus 101. Accordingly, Nakano does not teach the present invention in which the disk array stores at least the information about the second storage region and the information about backup of the first storage region in a storage region different from the second storage region within the disk array.

Conclusion

As you requested, two CD-R's are enclosed containing electronic copies of the references located and this report. Our invoice is enclosed for services and disbursements expended in conducting the search. Should you have any questions regarding the search or its results, please let us know.

Best regards,

Mattingly, Stanger & Malur, P.C.

By:

Colin D. Barnitz

Enclosures



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Yasuyuki MIMATSU et al.
Serial No.: 10/650,858
Filed: August 29, 2003
For: DATA BACKUP METHOD AND SYSTEM
Group: 2186
Examiner: Not yet assigned

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §1.97 & 1.98**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

December 29, 2004

Sir:

In the matter of the above-identified application, Applicants are submitting herewith a search report and copies of the documents listed in the attached form equivalent to Form PTO-1449 for the Examiner's consideration.

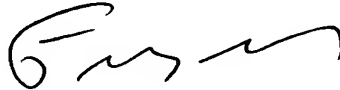
This information disclosure statement is being submitted before the mailing date of a first office action on the merits.

Each of the documents listed on the attached form equivalent to Form PTO-1449 is in the English language.

It is respectfully requested that this information disclosure statement be considered by the Examiner.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Mattingly, Stanger & Malur, Deposit Account No. 50-1417 (referencing attorney docket no. 500.43092X00) please credit any excess fees to such deposit account.

Respectfully submitted,



Frederick D. Bailey
Registration No. 42,282
MATTINGLY, STANGER & MALUR, P.C.

FDB/sdb
(703) 312-6600

FORM PTO-1449 U.S. Department of
Commerce (Rev. 4/92) Patent and Trademark
Office

ATTY. DOCKET NO.

500.43092X00

SERIAL NO.

10/650,858

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

APPLICANT

Yasuyuki MIMATSU et al.

FILING DATE

August 29, 2003

GROUP

2186

(Use several sheets if necessary)

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	6,205,450	03-2001	KANOME			
	6,691,245	02-2004	DEKONING			
	6,694,413	02-2004	MIMATSU et al.			
	2003/0131278	07-2003	FUJIBAYASHI			
	2004/0093474	05-2004	LIN et al.			
	2004/0168034	08-2004	HOMMA et al.			
	2004/0186900	09-2004	NAKANO et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	ABSTRACT	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation is considered, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.